**Stat and Data Analysis Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CW 9.2**

1. In December 2003 a water conservation campaign was conducted in a particular county. In January 2004 a random sample of 500 homes was selected, and water usage was recorded for each home in the sample. The sample found that 220 homes had reduced water consumption. The county supervisors want to know whether the data support the claim that **fewer than half** the households in the county reduced water consumption.
   1. Run a test of significance with a level of significance of 1%.
   2. Estimate the actual proportion of households that had reduced water consumption using a 95% confidence interval.
   3. Does the confidence interval confirm your conclusion that the proportion of households that reduced water consumption is less than half? Why?
2. The Public Policy Institute of California reported that 71% of people nationwide prefer to live in a single-family home. To determine whether the preference of Californians are consistent with the nationwide figure (or are different), a random sample of 2002 Californians were interviewed. Of those interviewed, 1453 said that they consider a single-family home the ideal. Run a test of significance with a level of significance of 1%.
3. I want to create a confidence interval with a margin of error of 2.5%, using 90% confidence, from a population that is believed to have *p* = 65%. What size sample do I need to take to achieve this?
4. If we wanted to estimate a population percent to within 4% using 99% confidence, what sample size would be necessary?
5. A 95% confidence interval from a sample of size 300 is given as (0.335, 0.445).
   1. What is the sample proportion?
   2. What is the margin of error?
   3. If the confidence level was decreased to 90% what would happen to:
      1. The critical value?
      2. The margin of error?
      3. The confidence interval?
   4. If the sample size had actually been 150, what would happen to:
      1. The critical value?
      2. The margin of error?
      3. The confidence interval?
6. In a test of significance with H0: *p* = 0.48 the test statistic was found to be *z* = 1.924.
   1. If HA: *p* > 0.48, what would you conclude if α = 0.05? (just state the first sentence of the conclusion)
   2. If HA: *p* > 0.48, what would you conclude if α = 0.01? (just state the first sentence of the conclusion)
   3. If HA: *p* ≠ 0.48, what would you conclude if α = 0.05? (just state the first sentence of the conclusion)
   4. If HA: *p* ≠ 0.48, what would you conclude if α = 0.10? (just state the first sentence of the conclusion)

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